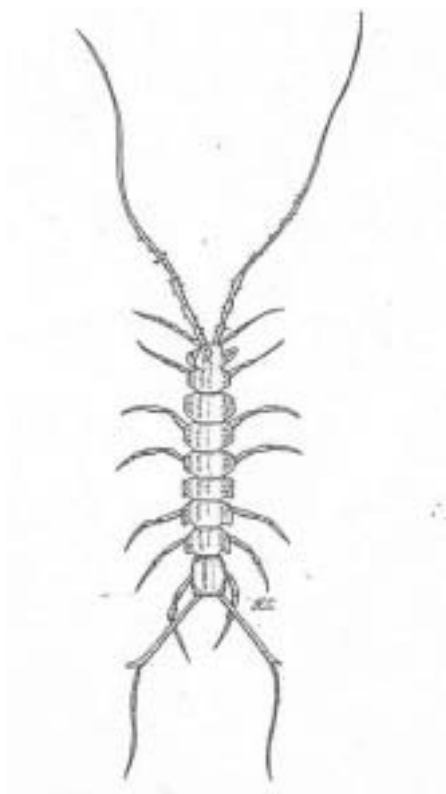


***Conservation Assessment  
for  
Two-Morphed Cave Isopod (Caecidotea dimorpha)***



*(from Franz and Slifer, 1971)*

***USDA Forest Service, Eastern Region***

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*This Conservation Assessment was prepared to compile the published and unpublished information on Caecidotea dimorpha. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject community and associated taxa, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Milwaukee, Wisconsin 53203.*

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## EXECUTIVE SUMMARY

The Two-morphed cave isopod is designated as a Regional Forester Sensitive Species on the Mark Twain National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare a Conservation Strategy, which will include management actions to conserve the species.

Caecidotea dimorpha is a rarely seen subterranean isopod found in caves, seeps and springs in northern Arkansas and southern Missouri.

## NOMENCLATURE AND TAXONOMY

**Classification:** Class Crustacea  
Order Isopoda  
Family Asellidae

**Scientific Name:** Caecidotea dimorpha

**Common Name:** Two-morphed cave isopod

**Synonyms:** Caecidoiea dimorpha  
Asellus dimorphus  
Conasellus dimorphus

This species was described by Mackin and Hubricht (1940) as Caecidoiea dimorpha, an unfortunate misprint of Caecidotea. The original description is superficial by present standards, but sufficient for characterization of the species. A more complete description was done by Lewis (1988). The morphology of the second pleopod endopodite tip of C. dimorpha and the recumbent form of C. stiladactyla are almost identical and the two species are difficult to separate. The relationship of these two species remains uncertain.

Henry and Magniez (1970) split the genus Asellus and moved the North American species into the genus Conasellus. Lewis (1980) followed Bowman (1975) in placing the North American asellids in Caecidotea rather than Conasellus or Asellus.

## DESCRIPTION OF SPECIES

Caecidotea dimorpha is an unpigmented (white) subterranean isopod with eyes vestigial or absent. Identification of this species requires laboratory dissection and examination of slide-mounted appendages under a compound microscope by a specialist in isopod taxonomy.

## LIFE HISTORY

Nothing specific is known of the life history of this species. Most subterranean isopods feed on microbial organisms and detritus, but this remains speculative in Caecidotea dimorpha.

## HABITAT

This is a subterranean species that has been found in cave streams (beneath rocks in riffles), seeps and springs (Mackin and Hubricht, 1940; Gardner, 1986; Lewis, 1988). The records of Caecidotea dimorpha from non-cave habitats like seeps and wells suggest that it is an inhabitant of groundwater rather than caves in the strict sense.

## DISTRIBUTION AND ABUNDANCE

Caecidotea dimorpha is found in northern Arkansas and southern Missouri. Mackin and Hubricht reported this species from a seep in Wayne County, Missouri and a spring in Jackson County, Arkansas. Gardner (1986) found the isopod in Mushroom Rock Cave, Barry County, Missouri. To this Lewis (1988) added the following Arkansas localities: Masons Cave, Jackson County; a well, Pope County, and a seep, Van Buren County. McDaniel and Smith (1976) reported the species from an unspecified locality in Searcy County, Arkansas. As a non-defined locality it can not be considered as a valid site for the species.

The three collections examined by Lewis (1988) varied in size from 1-26 specimens, indicating that if collecting effort is similar, the isopod is sporadic, but in some situations relatively common.

## RANGEWIDE STATUS

**Global Rank:** G1/G2 critically imperiled/imperiled; The global rank of G1 is usually given to a species known from 1-5 sites, G2 assigned to species known from 6-20 sites. Caecidotea dimorpha has been recorded from 6 localities, which places it on the line between the two rankings.

**Missouri State Rank:** S1 critically imperiled; The state rank of S1 is assigned to a species that is known from between 1-5 localities within the state. Caecidotea dimorpha has been recorded from two localities in Missouri.

## POPULATION BIOLOGY AND VIABILITY

Gardner (1986) reported that Caecidotea dimorpha co-occurred with the isopod Lirceus sp., amphipods Crangonyx sp., and Stygobromus ozarkensis in a cave stream in Missouri. Little is otherwise known of the population biology of this rare species.

## POTENTIAL THREATS

No threats to any specific sites inhabited by Caecidotea dimorpha were reported by any reviewer of this assessment.

There are numerous potential threats that might reasonably occur on national forest land due to the presence of Caecidotea dimorpha in the restricted cave and groundwater environment. These include problems caused by activities outside of forest owned properties that may be imported by surface runoff or groundwater flow. Potential contaminants include (1) sewage or fecal contamination, including sewage plant effluent, septic field waste, campground outhouses, feedlots, grazing pastures or any other source of human or animal waste (Harvey and Skeleton, 1968; Quinlan and Rowe, 1977, 1978; Lewis, 1993; Panno, et al 1996, 1997, 1998); (2) pesticides or herbicides used for crops, livestock, trails, roads or other applications; fertilizers used for crops or lawns (Keith and Poulson, 1981; Panno, et al. 1998); (3) hazardous material introductions via accidental spills or deliberate dumping, including road salting (Quinlan and Rowe, 1977, 1978; Lewis, 1993, 1996).

Habitat alteration due to sedimentation is a pervasive threat potentially caused by logging, road or other construction, trail building, farming, or any other kind of development that disturbs groundcover. Sedimentation potentially changes cave habitat, blocks recharge sites, or alters flow volume and velocity. Keith (1988) reported that pesticides and other harmful compounds like PCB's can adhere to clay and silt particles and be transported via sedimentation.

There is a long history of mineral (e.g., zinc, lead) exploration and development in the southeastern and east central Ozarks and groundwater contamination is a potential threat. Dewatering of karst systems by well drawdown and mine pumping may also be a threat to groundwater species.

With the presence of humans in caves comes an increased risk of vandalism or littering of the habitat, disruption of habitat and trampling of fauna, introduction of microbial flora non-native to the cave or introduction of hazardous materials, e.g., spent carbide, batteries (Peck, 1969; Elliott, 1998). The construction of roads or trails near cave entrances encourages entry.

## SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

Mushroom Rock Cave is on the property of the Mark Twain National Forest.

## **SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES**

There are no species specific activities concerning Caecidotea dimorpha being conducted.

Caves and springs located on the Mark Twain National Forest are subject to Forest Plan standards and guidelines for cave and spring protection and management. Perennial springs and spring branches will have a minimum 100 foot buffer zone within which any treatment will be modified on a case-by-case basis to: (1) meet state water quality standards and regulations, (2) comply with the riparian zone standards and guidelines identified under forest-wide 2500 (water and soil resource management) and 2600 (wildlife habitat management), (3) protect visual aspects, and (4) protect and enhance natural plant and animal communities. Similar guidelines exist for the management of seeps and fens.

Caves in the Mark Twain National Forest are recognized as specialized habitat areas and will be managed in accordance to the recommendations established by Gardner in 1982 in "An Inventory and Evaluation of Cave Resources of the Mark Twain National Forest". This includes the designation of an area of at least five acres centered on and completely surrounding a cave entrance for permanent old growth management. Insecticides and herbicides will not be used within the surface and known subsurface watersheds of caves utilized by the Indiana or Gray bats, Ozark cavefish, or any state endangered or rare species.

## **RESEARCH AND MONITORING**

The Cave Research Foundation is conducting bioinventories of stream caves within the general area in Barry County where Caecidotea dimorpha is known to occur, although the isopod has not been found in any of the sites surveyed.

## **RECOMMENDATIONS**

Retain on list of Regional Forester Sensitive Species.

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